Antibiotic susceptibility survey of *Neisseria gonorrhoeae* in Tucumán, Argentina

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In 1976, strains of *N gonorrhoeae* able to synthesise β-lactamase, codified by plasmids, were described for the first time more or less simultaneously in the United Kingdom and the USA.[1]

In 1983 the high prevalence of tetracycline-resistant, β-lactamase producing *N gonorrhoeae* strains led to the adoption of spectinomycin as recommended therapy for gonorrhoea in Thailand. While spectinomycin-resistant strains developed rapidly in both the Republic of Korea and the Philippines, spectinomycin has retained its effectiveness in Thailand and remains the drug of choice for the treatment of gonorrhoea.[2]

In Tucumán, isolates of *N gonorrhoeae* were obtained from patients with symptomatic sexually transmitted diseases during 1987–1990. There was no selection of the isolates; all isolates growing on subcultures were tested. No information was available on the incidence of treatment failures or repeated isolates from the same patient.

β-Lactamase production was tested by the cephalosporin chromogenic method, using nitrocefin (Shoid-Glaxo).

Antimicrobial susceptibility was judged according to breakpoints previously defined in the literature.[3]

Fifty-seven isolates of *N gonorrhoeae* were examined to determine their antibiotic susceptibilities. The MICs of the tested isolates and the range of MICs for each tested antibiotic are given in the table. β-lactamase was produced by 2 of the 57 isolates (3·5%).

Peeters *et al*[4] studied in three different periods (1981–1984–1985) the susceptibility to penicillin, tetracycline and spectinomycin in 302 clinic isolations of β-lactamase producing and β-lactamase negative gonococci and compared the susceptibility variations of the strains. In 1981, 7% of the strains were susceptible to a penicillin MIC higher than 32 $\mu g ml^{-1}$. In 1984 and 1985 this percentage was 48 and 23 respectively. A similar behaviour was presented by gonococci to tetracycline, in which case 50% of the strains showed a MIC higher than 1 $\mu g ml^{-1}$ in 1984, and only 6% reached this value in 1985. Spectinomycin showed another behaviour; the increase was gradual through the years, reaching a MIC value of 32 $\mu g ml^{-1}$ for 60% of the strains in 1985.

Our results indicate that only 1·75% was resistant to spectinomycin (table), but on the other hand they showed a MIC value higher than 25 $\mu g ml^{-1}$ in 7% of the gonococci strains, which makes an epidemiologic control necessary.

In Tucumán, 93% of the *N gonorrhoeae* strains presented a MIC value of $\leqslant 0{\cdot}02$ $\mu g ml^{-1}$ to cefotaxime.

All our strains were highly sensitive to norfloxacin. In Tucumán, all of the *N gonorrhoeae* strains had a MIC value of $\leqslant 0{\cdot}25$ $\mu g ml^{-1}$. Of the *N gonorrhoeae* strains 98% were sensitive to kanamycin and 68% of these 98% showed a MIC value of $\leqslant 0{\cdot}2$ $\mu g ml^{-1}$.

Of the isolated strains 14% showed resistance to tetracycline; the CDC (Centers for Disease Control) established in 1985 that strains resistant to tetracycline, located on plasmids, must show MIC levels higher than 10 $\mu g ml^{-1}$; None of our isolations exceeded this value, which could indicate the absence of a mediator plasmid with the mentioned resistance.

The norms for the gonorrhoea treatment without complications in Tucumán include the recommendation of penicillin use as preferable antibiotic. Owing to the low incidence of PPNG in Tucumán, it is recommended that this antimicrobial should continue to be used, provided that this is always done under strict study of the isolated organisms to avoid failures through proliferation of resistant strains, obtained by the presence of plasmids or by the increase of their MIC due to chromosomal mutations.

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Antibiotic	MIC limit ($\mu g ml^{-1}$) Susceptible $\leqslant$	Resistance $\geqslant$	Percentage of Susceptibility	Percentage of Resistance
Penicillin	0·06	2	96·50	3·50
Ampicillin	1	4	96·50	3·50
Cephaloridine	4	16	96·50	3·50
Cephalexin	4	16	96·50	3·50
Cefoxitin	2	8	100·00	0
Cefotaxime	0·5	2	100·00	0
Kanamycin	4	64	98·25	1·75
Spectinomycin	32	128	98·25	1·75
Tetracycline	0·25	2	85·95	14·03
Norfloxacin	4	10	100·00	0

*The MIC limits are according to the NCCLS.[3]

1 Ashford W, Golash R, Hemming G. Penicillinase-producing *Neisseria gonorrhoeae*. *Lancet* 1980;5:39.
2 Traisupa A, Ariyarit C, Saengsur S, Theeratum C, Tharavanich S. Spectinomycin-resistant gonococci in Thailand. *Clin Ther* 1990;12:101–4.
3 National Committee for Clinical Laboratory Standards. Standard methods for dilution antimicrobial susceptibility test for bacteria that grow aerobically. Approved standard M7-A2. National Committee for Clinical Laboratory Standards, Villanova, Pa. 1990.
4 Peeters M, Frost EH, Collet M, Ossari S, Yvert F, Ivanoff B. Changing antibiotic susceptibility of *Neisseria gonorrhoeae* in Franceville, Gavon. *Antimicrob Agents Chemother* 1987; 31:1288–90.